While ideas differ...

Meat Quality is Defined

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If you were to ask ten people to give you a definition of meat quality, more than likely you would obtain ten different definitions. This is not surprising since most people formulate their own definition based on their likes and dislikes. Generally, meat scientists define quality two ways.

1. In the consideration of carcasses, quality refers to the amount of marbling, the texture of grain of the meat, the firmness and color of the lean, the firmness and color of the fat, and the character of the bone. Marbling receives the most emphasis for several reasons. Originally, it was thought that marbling was highly related to tenderness; however, some evidence has been published which does not agree with this reasoning. Some controversy exists at present with regard to whether marbling is a good indicator of meat quality or not. This point will probably be debated for sometime to come. Nevertheless, marbling is related to muscle firmness, flavor and juiciness and is a very important factor in meat quality evaluation. At the present time, we have ten degrees of marbling ranging from devoid to abundant. It is generally accepted that as the marbling increases, the quality increases; however, this has not been justified by research. Possibly, quality may improve as the amount of marbling increases to a certain point, and thereafter, there is no beneficial improvement in quality with an increase in marbling. Further research in this area is necessary before definite statements can be made.

A high quality lean is characterized by a very fine texture of muscle and is velvety to the feel. The texture or grain of the muscle is evaluated in a similar manner to that used in evaluating the grain of wood. As the texture becomes courser, the quality becomes less desirable. A high quality lean should be very firm to the touch and not soft, watery, or gummy.

The color of lean is a very important factor in quality, more from the psychological standpoint than from anything else. If the color of the lean is not of an eye-appealing nature but all the other quality characteristics indicate that it is of high quality, it will be objected to by the majority of consumers. This is not surprising since the appearance of a product has a very strong influence on eating satisfaction. The desired color of beef is cherry-red; in lamb, light-pink; and in pork, grayish-pink. The age of an animal at the time of slaughter has a very definite effect on the color of the lean. As the animal progresses in age, the color of the lean becomes darker. In addition, the color of the lean can be strongly altered by stress prior to slaughter. In many cases, this results in a definite lowering of the quality of the meat. As meat is stored in the display case in the retail market, it gradually becomes darker in color. This is a natural change because many factors such as light and heat cause the muscle to darken in color even though the quality is not altered to any appreciable extent. Spoilage of meat will often result in the darkening of its color. Many times, natural darkening of the meat results in the consumer thinking that the meat is spoiled. This is not always the case! When meat is darkened due to spoilage, it is generally accompanied by a very unpleasant odor and this can be determined without difficulty.

The fat should be very firm and white or creamy-white in color. Yellow fat is ob-
Aging of meat allows the natural occurring enzymes within the tissues to break down some of the components of the tissue and, therefore, improve the overall eating quality. Often carcasses are aged in excess of fourteen days since some of the large eating establishments specify meat that has been aged three to four weeks. It is quite probable that meat aged this period of time could develop what is termed “an aged flavor.” Some people like this flavor and many do not. Research indicates that you don’t benefit greatly by aging in excess of fourteen days other than to enhance flavor.

II. When one considers the other definition of meat quality, it is dependent on such factors as: color, aroma, flavor, juici-

ness, and tenderness. These characteristics comprise the definition of meat-eating quality or palatability when considering cooked, individual retail cuts.

The color of cooked, un cured lean depends largely on the nature and amount of muscle pigment present in the partially decomposed cooked products. Final color of cooked meat depends upon the pigment changes that take place during cooking. These changes are determined by: (1) the type of cooking; (2) the length of cooking; and (3) the temperature of cooking. The color of the fat changes very little during cooking except for surface browning which contributes greatly to the attractive appearance of cooked meat, especially by the dry-heat method of cooking.

In the case of cured meats, a different situation exists primarily due to the fact that this color is a result of the action of some of the curing ingredients on muscle pigments. Meat from an older animal generally is darker than that from a younger animal, primarily due to the fact that there has been an increase in the amount of muscle pigment in the older animal. It is not uncommon to find muscles coming from the same animal which are quite different in color after cooking. Some experts say this is due primarily to the function of each muscle in the movement of the animal. If one muscle is required to do more work than another muscle, it is quite probable that this muscle will contain a larger quantity of the muscle pigments, especially myoglobin.

Fresh meat usually has a slight aroma that is sometimes described as being reminiscent of commercial lactic acid. Aging of meat will greatly change this aroma, and meat from older animals has a stronger aroma than that from younger animals. Many different aromas have been associated with meat, some of which are natural occurring and some caused by improper handling. Upon cooking, these “off odors” intensify greatly.

Meat flavor, like aroma, is very difficult to describe, but it is known that the flavor and meat is at a loss to differentiate between flavor and aroma. The flavor of raw meat is weak, salty, and blood -like. True flavor develops during the cooking process, and is thought to arise partly from the muscle protein reacting with some of the sugars present in the meat. The nature and intensity of meat flavor depends in part on the type of cooking, the length of cooking, and the temperature of cooking. For example, a leg of lamb cooked to an internal temperature of 150°F. has more flavor and tastes more distinctive than a similar leg cooked to 190°F.

Cooked, unaged beef is quite metallic and astringent and lacks the typical beef flavor. The true flavor of beef develops in about eight days and is intensified somewhat thereafter. Generally, real flavor is considered to be sweet, sour, or flat, whereas pork flavor is considered to be biting. Much variability exists with regard to flavor, and the flavor of the meat coming from each species is characterized to a large degree by the composition of the fat within and covering the cut.

Juiciness of the meat is very important with regard to eating quality and is influenced by many factors. The juiciness of cooked meat may be separated into two effects, wetness during the first chew and sustained juiciness. Often juiciness is confused with tenderness of meat in that if a cut is quite juicy, a person thinks that it is quite tender. This is true to a certain extent since the more tender the meat is, the more quickly the juices are released upon chewing.

Consumer studies have shown that tenderness is the most important factor of meat eating quality. Tenderness is influenced by many factors and can be listed as pre and post slaughter influences. The overall impression of tenderness consists of at least three components: (1) the ease with which the teeth sink into the meat when chewing begins; (2) the ease by which the meat breaks into fragments (friability); and (3) the amount of residue remaining after chewing.

A wide range in the degree of tenderness occurs between animals and between muscles within the same animal. Functions of the muscle within the animal is the primary reason for variation in tenderness of the muscles within the animal. In addition, much variation in tenderness has been observed within a specific muscle. For example, the loin eye muscle is most tender in the middle and decreases as one approaches the anterior or posterior portions of the muscle. This variation could be a result of the difference in the function of the various parts of the muscles which, in turn, produces changes in the composition which leads to tenderness variation within the muscle.

Quite frequently a statement is made that if a carcass yields a high percentage of saleable retail cuts (high cutability), it possesses high quality. This statement is quite correct because quality has very little to do with cutability. These two terms should not be confused or used synonymously. In fact, in many cases, a carcass which possesses high quality will have a low cutability.

The quality of a cut may be optimum but improper handling, storage, and cooking can quickly reduce the quality to the point that the meat is very objectionable when consumed. Proper handling techniques in the home cannot be overemphasized because much high-quality meat is essentially ruined by improper handling or storage via the housewife. The cooking method utilized is very important in determining whether the initial quality of a cut is carried through to consumption. Many times the quality of a cut is greatly reduced by selection of an improper cooking method. If consideration is given to the handling and cooking of meat in the home, it will lead to the continuous consumption of high-quality meat products.